

REMARKS

Status of the Claims

Claims 1-3 and 6-10 are pending in this application. Claims 4 and 5 have been canceled. Claim 10 has been added. Claim 1 has been amended to recite that the copolymer is obtained from the monomer units of I, II and III and amended to incorporate the subject matter of claims 4 and 5 and the disclosure at page 38, lines 29-32. Support for new claim 10 is found at page 40, lines 31-35. No new matter has been added by the above claim amendments.

Claim Objection

Claims 1-9 are objected to for inappropriate claim language regarding the phrase "copolymer comprising. . . monomer. . . monomer and monomer." The Examiner states that the copolymer cannot "comprise" the three monomers, but instead the three monomers are polymerized to form the copolymer. Applicants amend the claims to recite that the copolymer is obtained by polymerizing monomer units (I)...(II)... and (III). As such, Applicants submit that the claim amendments correct any syntax errors in the claim language. Thus, this objection should be withdrawn.

Rejections under 35 USC 102(b)*The Present Invention*

The present invention is directed to a primer coating composition capable of improving the adhesion and weather resistance of molded parts of thermoplastic resins, such as polycarbonate, which are subsequently coated with an organopolysiloxane coating. Specifically, when the organic copolymer, having benzotriazole based UV absorbing groups fixed to the polymer backbone through chemical bonds, is used in the primer coating composition, the organic copolymer does not migrate to the surface, it is not dissolved in water and solvents, thus eliminating the whitening phenomenon of the outer appearance.

The initial loading of the organic copolymer is retained over a long period of time, and the UV absorbing effect declines little with the lapse of time. Even on heat curing at an elevated temperature, the UV absorber does not volatilize off the coating. The copolymer is so compatible with other components in the primer coating composition that a large amount of the copolymer may be added without detracting from the transparency and adhesion of the primer coating composition to the substrate or the protective coating.

Since a vinyl monomer containing an alkoxysilyl group is used, alkoxysilyl groups are introduced into the primer coating layer to provide the primer coating layer with a reactivity with a

protective coating layer to be applied thereon, which improves adhesion. This, combined with crosslinking among alkoxy-silyl groups, contributes to improvements in heat resistance and durability.

Moreover, when a compound containing a nitrogen atom and an alkoxy-silyl group in one molecule, more particularly a compound obtained by reacting an amino group-containing alkoxy-silane with an epoxy group containing alkoxy-silane and a silylating agent and amidating the reaction product thereof is added to the organic copolymer, the primer coating layer is given water-proof adhesion. The compound crosslinks with alkoxy-silyl groups in the organic copolymer to densify the primer coating and serves to fix the photo-stabilizer and other optional additives within the primer coating layer. The copolymer can introduce a large amount of UV absorbing groups in the primer coating layer while maintaining various useful properties, and eliminates the addition of or reduces the amount of UV absorber in an organopolysiloxane based overcoat where a UV absorber can be a detrimental factor to the mar resistance of the overcoat.

Thus, the inventive primer coating composition is useful in protecting surfaces of various articles, especially plastic articles, imparting improved transparency, mar resistance, weather resistance and chemical resistance. Evidence of these advantageous

features are fully demonstrated in Tables 8-12, see examples 33-39 and comparative examples 14-23.

The Examiner rejects claims 1, 6 and 9 as anticipated by Funaki et al. USP 5,250,359 (Funaki '359). Applicants traverse the rejection and respectfully request the withdrawal thereof.

Funaki '359 discloses a resin molded article coated with an undercoating composition. Please see Example 2 of Funaki '359, which discloses an undercoating composition which contains a copolymer of (i) 60 wt% of ethyl methacrylate, (ii) 20 wt% of γ -acryloxypropyltrimethoxysilane and (iii) 20 wt% of 2-[2'-hydroxy-3'-tert-butyl-5'-(2-hydroxy-3-methacryloxy)propoxyphenyl]benzotriazole. The undercoating composition is applied to a polycarbonate substrate, which is then overcoated by a composition containing γ -acryloxypropyltrimethoxysilane, methyltrimethoxysilane and colloidal silica. The coated polycarbonate may have a good appearance and hardness, abrasion resistance, adhesion property and water resistance. However, Funaki '359 does not anticipate the present invention.

The Examiner also rejects claims 1-3 as anticipated by WO 98/34991 (WO '991). Applicants traverse the rejection and respectfully request the withdrawal thereof.

WO '991 discloses a paint resin emulsion having improved weatherability. The synthetic example discloses monomers such as (a-1) 4-methaclyoxy-2,2,6,6-tetramethylpiperidinyll methacrylate,

(a-2) N-methyl-2,2,6,6-tetramethylpiperidinyll methacrylate, (b-1) γ -methacryloxypropyltrimethoxy silane and (c-1) 2-(2'-hydroxy-5'-methacryloxyethylphenyl)-2H-benzotriazole, which are co polymerized and contained in the emulsion. Examples 4 and 5 disclose a copolymer obtained from these monomers and other copolymerizable monomers. The emulsion forms the paint film, which may have such properties as gloss-retaining ability, anti-discoloring ability, solution, crack and blister resistance. Yet WO '991 does not anticipate the present invention.

Applicants submit that neither Funaki '359 nor WO '991 discloses the use of a compound obtained by reacting an amino group-containing alkoxysilane with an epoxy group containing alkoxysilane and a silylating agent and amidating the reaction product thereof in the primer coating composition. By using the specific compound, the inventive composition provides a primer coating with an excellent adhesion, in particular a water-proof adhesion as well as enhanced curing properties.

As such, Applicants submit that neither Funaki '359 nor WO '991 discloses all of the elements of the present invention and these rejections should be withdrawn.

Rejections under 35 USC 103(a)

The Examiner rejects claims 2 and 3 as obvious over Funaki '359 in view of WO '991. Applicants traverse the rejection and respectfully request the withdrawal thereof.

Applicants rely on the arguments above about how neither Funaki '359 nor WO '991 discloses the use of a compound obtained by reacting an amino group-containing alkoxysilane with an epoxy group containing alkoxysilane and a silylating agent and amidating the reaction product thereof in the primer coating composition. Applicants further submit that this claim element is also not suggested by Funaki '359 or WO '991. This claim element provides the primer coating with the excellent adhesion properties, in particular water-proof adhesion as well as enhanced curing properties. These properties are not suggested by Funaki '359 or WO '991.

As such, Applicants submit that no prima facie case of obviousness has been established since each of the claimed elements is not disclosed or suggested by the combination of cited art. Thus, Applicants respectfully request that the rejection be withdrawn.

The Examiner also rejects claims 4 and 5 as obvious over Funaki '359 or WO '991 in view of Chang et al. USP 4,043,953 (Chang

'953). Applicants cancel claims 4 and 5; thus, this rejection should be withdrawn as moot.

However, Applicants address this rejection as it may apply to newly amended claim 1. Applicants submit that this rejection fails for the reasons explained above regarding failure to disclose or teach the use of a compound obtained by reacting an amino group-containing alkoxy silane with an epoxy group containing alkoxy silane and a silylating agent and amidating the reaction product thereof in the primer coating composition. The deficiencies of Funaki '359 and WO '991 are discussed above. Chang '953 discloses an ambient temperature, moisture-curable coating composition which includes an acrylic-silane interpolymer of an ethylenically unsaturated monomer and a copolymerizable organoalkoxy silane, a cure accelerating catalyst and a monomeric hydrolytically reactive organosilicone stabilizer. The organosilicone stabilizer may be a compound containing a nitrogen atom and an alkoxy silyl group in a molecule such as γ -aminopropyltriethoxy silane and is used to increase potlife of the composition.

However, Applicants submit that Chang '953 fails to compensate for the deficiencies in Funaki '359 and WO '991. Chang '953 also fails to disclose or suggest the use of a compound obtained by reacting an amino group-containing alkoxy silane with an epoxy group containing alkoxy silane and a silylating agent and amidating the reaction product thereof. In Chang '953, the concern is increasing

the potlife of the composition. Chang '953 fails to suggest a cured composition having properties required for a primer coating layer such as weather resistance or adhesion.

The present invention is not concerned with potlife of the composition, but is instead concerned with forming a satisfactory bond having water resistance and fixing within the coating the benzotriazole based vinyl monomer, the organic copolymer and the optional photo-stabilizer by crosslinking with the alkoxysilyl groups of the specific compound of the present invention. By covering plastic substrates such as plastic films and sheets with the cured coat of the primer coating composition, the substrates are improved in initial adhesion, heat resistance, hot water resistance and weather resistance. Coated plastic articles, especially of polycarbonate resins, having coatings of the inventive coating compositions are endowed with improved transparency, mar resistance, weather resistance and chemical resistance as demonstrated in the examples in the specification. The present invention provides a primer coating having excellent water-proof adhesion and curing properties. Chang '953 fails to suggest achieving these specific properties.

For the foregoing reasons, Applicants respectfully request that these obviousness rejections be withdrawn.

Comments on Noda et al. USP 6,372,355

Applicants submit the certified English translations of JP 2000-027713 and JP 2000-027719 to overcome any rejection that could be made under 35 USC 102(e) over Noda '355. Applicants also submit that the above arguments regarding WO '991 also apply to any rejection that could be made with Noda '355. Noda '355 also fails to disclose or suggest use of a compound obtained by reacting an amino group-containing alkoxysilane with an epoxy group containing alkoxysilane and a silylating agent and amidating the reaction product thereof. As such, Applicants submit that the present invention is free of any rejection over Noda '355.

Comments on Valet et al. USP 5,356,995

The Examiner cites Valet '995 as also anticipating claim 1. Applicants submit that Valet '995 discloses a curable composition comprising (a) a silicon-containing copolymer, (b) a (meth)acrylic copolymer and (c) at least one curing agent, each of the copolymers contains functional groups which are able to react with the curing agent, wherein only component (a) contains a UV absorber, which is a derivative of 2-(2-hydroxyphenyl)benzotriazole or of o-hydroxyphenyl-s-triazine in copolymerized form. The cured composition may have weathering resistance and high gloss. However, Applicants submit that Valet '995 fails to disclose the use of a compound obtained by reacting an amino group-containing

alkoxysilane with an epoxy group containing alkoxysilane and a silylating agent and amidating the reaction product thereof.

Conclusion

As Applicants have addressed and overcome all objections and rejections in the Office Action, Applicants respectfully request that the objections and rejections be withdrawn and that the claims be allowed.

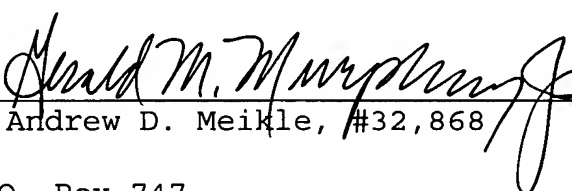
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Kecia Reynolds (Reg. No. 47,021) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s): English Translations of JP 2000-027713 and JP 2000-027719

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